Analysis of the Needs of Developing Teaching Materials Based on Learning Management System

Tri Yunita

Educational Technology, University of Bengkulu
Bengkulu, Indonesia
triyunita36@gmail.com

Abstract

The purpose of this research is to analyze the result of the response to the needs of development of Learning Management System for students. This research is a descriptive research part of R&D research using the ADDIE model. The instruments used are observation sheets, interview sheets, and questionnaire sheets. The subjects consisted of physics teachers and class X students with 96 students and 2 teachers. The instruments used in this study are Likert scale, students and teachers in 3 vocational high schools in Bengkulu City strongly agree and need of LMS-based teaching materials is proven to increase students' independence and learning achievement.

Keywords: *Teaching materials, Learning Management System, Learning independence, Learning Achievement*

A. Introduction

The development of Information and Communication Technology (ICT) has a major effect on the progress of education in Indonesia, one of which is the ICT-based learning process that uses interactive teaching materials so that students can describe something abstract and complicated into things that can be explained in a simple way so that it is more easily understood by students.

According to Widodo & Jasmadi explains that teaching materials are a set of learning tools or tools that contain learning materials, methods, limitations and ways to evaluate which are systematically designed and attractive in order to achieve the expected goals [1]. This definition explains that a teaching material must be designed and written with instructional rules because it will be used by teachers to assist and support the learning process.

Teaching materials are all forms of materials, both written and unwritten, that are used to help teachers carry out teaching and learning activities [2]. Teaching materials according are all information, tools and texts that are arranged in sequence so that they can be understood by students and used in the learning process [3]. Teaching materials according are all forms of materials or subject matter that are systematically arranged which can be used by teachers [4].

Based on the above opinion, it can be concluded that teaching materials are tools or media that can be used to achieve learning objectives so that they can make it easier for students to understand learning materials. One of the visual-based teaching materials can be an LMS (Learning Management System). LMS or learning Management system is software that is used for administration, documentation, reports of an activity, teaching and learning activities, and activities carried out online [5]. LMS is software that functions to deliver web-based online learning materials to manage learning activities and results [6]. Learning Management System (LMS) is a software that comprehensively integrates various features for course delivery and management. The LMS handles the features of course catalog, course delivery, assessment and quiz [7].

Meanwhile Learning Management System (LMS) or Course Management System (CMS), also known as Virtual Learning Environment (VLE) is a software application used by educators, universities and schools as an internet-based online learning media (e-learning) [8] .

So it can be concluded that LMS is an e-learning system that can support learning because it contains quizzes, assignments, downloads, materials, learning can be accessed anywhere and anytime, and discussions between teachers and students.

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LMS (Learning Management System) based teaching material is one form of ICT (Information and Communication Technology) teaching material that is built based on the Web which will run on a web server and can be accessed by participants through a Web Browser (Web Client). The material presented can use media such as text, images, audio or video.

The LMS serves to organize the management of learning in the e-learning model. There are several advantages of E-learning, namely learners can share information with each other and can access information or learning materials anytime and anywhere so that it can train learning independence and can also improve student achievement. Learning independence is an individual who is actively involved in the learning environment, organizes and trains and can use his abilities effectively and has a positive motivation regarding his abilities in learning. Meanwhile, according to Siti Pratini, Learning Achievement is a result achieved by a person in carrying out learning activities [9].

Learning independence is independent learning, not depending on others, students are required to have their own activeness and initiative in learning, behavior, nation and state [10]. There is also the opinion that learning independence is self-awareness, self-driven, the ability to learn to achieve its goals [11].
So it can be concluded that learning independence is a condition of independent learning activities that does not depend on others, has responsibility and can solve learning problems.

Learning independence will be realized if students can control themselves everything that is done, evaluate, and then can plan something more in the learning activities carried out and students also want to be active in the learning process.

With the LMS, the learning process can run smoothly and students are able to access and process learning resources needed to achieve their goals so that they can learn independently.

Vocational education is an education unit that prepares students to work in a particular field. Vocational education is geared towards studying specialized fields so that graduates have certain skills and develop their careers to work productively and independently. Vocational High School (SMK) is one form of vocational education unit at the secondary education level as a continuation of junior high school, MTs or other equivalent forms.

SMK Negeri 3 Kota Bengkulu is one of the schools that organizes vocational education with the Computer Network & Telecommunication Engineering Expertise Program (TJKT). TJKT Expertise Program students are advised to have a laptop because learning and practice use a laptop. For cell phones (HP) students almost all have. So this is a great opportunity to develop learning media that can be accessed by students either using a laptop or handphone and can help students understand concepts, especially in carrying out practicum independently.

One of the subjects of the TJKT Expertise Program taught in the Teaching and Learning Activities (KBM) process at SMK Negeri 3 Bengkulu City is Vocational Basics. The learning process at SMK Negeri 3 Kota Bengkulu Class X in the Vocational Basics subject has not been running optimally, because too much material is delivered. And the lack of time in doing practice, it makes it difficult for students to master the material presented by the teacher. In addition, the limited number of lesson hours so that in practicing learning is not optimal and students are sometimes less independent in doing practice, as well as giving assignments sometimes still want to see their friends and students do not dare to express their opinions and are lazy to ask, so that there is no independence in learning and the results obtained are not good.

Vocational Fundamentals is one part of the Productive Subjects in SMK Computer Network & Telecommunication Engineering Expertise Program in class Ten. This lesson requires students to understand more about the material of TJKT Technology Development, the development of 5G technology. Learning Outcomes At the end of phase E, students are able to understand technological developments in computer network engineering and telecommunications devices including 5G. In the learning process, there are several obstacles experienced during this learning process, including the absence of representative teaching materials and the learning used sometimes runs out of time only for practice so that understanding of concepts is not achieved so that learning is less effective.

Based on the description above, it is necessary to develop LMS-based teaching materials that can be used by students in learning activities to increase students' independence and learning achievement. The purpose of this study is to describe the results of the analysis of the needs of students for the development of elearning teaching materials in Vocational Fundamentals of Vocational High School subjects.

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B. Research Methods

This research was conducted at SMKN 3, SMKN 1 and SMKN 6 Bengkulu City, the research time was held on January 11-17, 2022. The sample taken in this study were class X students of the TJKT (Computer Network and Telecommunication Engineering) Expertise Competency of SMKN 3, SMKN 1 and SMKN 6 Bengkulu City as many as 96 students and 2 Vocational Basics Subject Teachers, namely SMKN 3 and SMKN 6 Bengkulu City. Data collection techniques in this study used observation, interview and questionnaire data. The instruments used are observation instrument sheets, interview instrument sheets and student needs analysis questionnaire instrument sheets for the development of LMS teaching materials which are filled out offline in the form of printouts.

The needs questionnaire analysis data obtained in this study were analyzed using a measurement scale that refers to the Likert scale so that the data analysis technique used was quantitative analysis technique. The Likert scale is a rating scale that can be used to measure the opinions, attitudes, or behavior of respondents to certain questions. [12]. The purpose of measuring the Likert scale is to convert qualitative responses into quantitative data so that it can be seen how much the respondent agrees or disagrees with the statement received. The term Likert scale is taken from the English Likert Scake which comes from the name of its creator 'Rensis Likert' who is an expert in social psychology from the United States. The term Likert scale is taken from the English Likert Scake which comes from the name of its creator 'Rensis Likert' who is an expert in social psychology from the United States. Rensis Likert stated that there are 5 basic choices used in Likert scale testing ranging from strongly agree (SS) to strongly disagree (STS). The five-scale Likert scale has the advantage that this questionnaire can accommodate respondents' answers that are neutral or undecided. [13]. A 5-point Likert scale is more widely used because a Likert scale of 5 points or more will make it more difficult for respondents to distinguish scale points and cause respondents to have difficulty processing information. [14].

The five basic points in the Likert scale test consist of Strongly Agree (SS), Agree (S), Disagree (KS), Disagree (TS), Strongly Disagree (STS). The form of the answer sheet given by the Likert scale can be seen in table 1

Table 1. Likert Score

Assessment	Score
Strongly Agree (SS)	5
Somewhat agree (S)	4
Neither agree (KS)	3
Somewhat disagree (TS)	2
Strongly disagree (STS)	1

Each item from the students' answers is processed using the questionnaire data management formula by means of data intervals and the results are made with graphic charts. The percentage used to calculate the answer to each question uses the equation. The way the formula calculates the Likert scale is [15]:

$$T \times Pn$$

In the data analysis process, there are two formulas that need to be known in order to get the final value of the Likert scale questionnaire. The formulas are as follows:

Interval Formulas: $I = T/Pn$

Index Formulas %: **Total Score / Y x 100**

Description:

- **T** = Total number of respondents who choose
- **Pn** = Number choice score Likert
- **I** = Range of distance
- **Y** = the highest score

Rumus Index % = Total Score / Y x 100

Calculating Interval Percent score (I):

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I = 100 / Total Score (Likert)
  = 100 / 5 = 20
Result (I) = 20
(this is the interval of distance from lowest 0 % up to highest 100%)

From the score interpretation measurement above, the results based on the interval are:

- Number 0% – 19,99% = Strongly disagree (STS)
- Number 20% – 39,99% = Somewhat disagree (TS)
- Number 40% – 59,99% = Neither agree (KS)
- Number 60% – 79,99% = Somewhat agree (S)
- Number 80% – 100%   = Strongly Agree (SS)

= Total score / Y x 100
= 247 / 500 x 100
= **49.4 %**, in the Undecided category

Table 2. Assessment Interval

Index	Assessment
Figures 80% – 100%	Strongly Agree (SS)
Figures 60% – 79,99%	Somewhat agree (S)
Figures 40% – 59,99%	Neither agree (KS)
Figures 20% – 39,99%	Somewhat disagree (TS)
Figures 0% – 19,99%	Strongly disagree (STS)

C. Results and Discussion

Based on the results of filling out the questionnaire analyzing the needs of students for the development of teaching materials given directly on January 11-17, 2023, from 20 questions given and respondents as many as 96 students, the overall results are as follows:

Table 3. Respondent Questionnaire Results

No	Statement List	Likert Scale					Tot Score	Index (%)	Decision
		SS	S	KS	TS	STS			
1	I like vocational fundamentals lessons	130	252	21	0	0	403	83.96%	Strongly Agree
2	I can easily understand the vocational basics lesson delivered by the teacher.	10	204	84	26	2	326	67.92%	Agree
3	I am used to using gadgets (laptop, cellphone)	190	208	18	0	0	416	86.67%	Strongly Agree
4	I am happy if I learn vocational basics using gadgets (laptop, cellphone)I am happy if I learn vocational basics using gadgets (laptop, cellphone)	190	200	24	0	0	414	86.25%	Strongly Agree
5	I sometimes get bored with the learning media used by the teacher	80	128	138	4	0	350	72.92%	Agree
6	I want teachers to use a variety of learning materials	175	216	18	2	0	411	85.63%	Strongly Agree

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No	Statement List	Likert Scale					Tot Score	Index (%)	Decision
		SS	S	KS	TS	STS			
7	I am happy when learning there are pictures that can explain the learning material	160	248	6	0	0	414	86.25%	Strongly Agree
8	I am happy if the learning media has an assessment score	115	208	60	2	0	385	80.21%	Strongly Agree
9	I am interested if the learning media has assignment documents	40	180	117	8	0	345	71.88%	Agree
10	I need a discussion forum to be able to ask questions with teachers or friends online	165	208	33	0	0	406	84.58%	Strongly Agree
11	I am interested if learning vocational basics using e-learning media	160	196	45	0	0	401	83.54%	Strongly Agree
12	I think learning vocational basics using e-learning media can increase my motivation to learn	125	176	81	0	0	382	79.58%	Agree
13	Vocational basics subjects are difficult to understand if explained in theory only	160	168	21	28	1	378	78.75%	Agree
14	The subject of vocational basics is a subject that is difficult to understand	25	168	93	14	11	311	64.79%	Agree
15	When explaining vocational basics subjects the teacher uses media	140	232	24	2	1	399	83.13%	Strongly Agree
16	Teachers never present interesting learning media in the learning process	5	96	117	30	17	265	55.21%	Disagree
17	The teacher explains the material using the LCD provided by the school.	175	200	33	0	0	408	85.00%	Strongly Agree
18	I have gadgets (laptop, cell phone)	225	200	0	0	1	426	88.75%	Strongly Agree
19	I always bring gadgets (laptop, cell phone) to school	220	204	3	0	0	427	88.96%	Strongly Agree
20	I think that learning vocational basics by using e-learning media will be more interesting in learning	385	76	0	0	0	461	96,04%	Strongly Agree

From the table above, the response of students in statement 3, namely students are accustomed to using 86.67% index devices, statement 4, namely towards learning vocational basics using 86.25% index devices, so that based on the results of the statement, students feel that learning using e-learning media is more interesting, so that the index achieved is 97.04%.

Table 4. Respondent Questionnaire Results as Percent

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No	Statement List	Total SS % (5)	Total S % (4)	Total KS % (3)	Total TS % (2)	Total STS % (1)
1	I like vocational fundamentals lessons	27.08	65.63	7.29	0.00	0.00
2	I can easily understand the vocational basics lesson delivered by the teacher.	2.08	53.13	29.17	13.54	2.08
3	I am used to using gadgets (laptop, cellphone)	39.58	54.17	6.25	0.00	0.00
4	I am happy if I learn vocational basics using gadgets (laptop, cellphone)I am happy if I learn vocational basics using gadgets (laptop, cellphone)	39.58	52.08	8.33	0.00	0.00
5	I sometimes get bored with the learning media used by the teacher	16.67	33.33	47.92	2.08	0.00
6	I want teachers to use a variety of learning materials	36.46	56.25	6.25	1.04	0.00
7	I am happy when learning there are pictures that can explain the learning material	33.33	64.58	2.08	0.00	0.00
8	I am happy if the learning media has an assessment score	23.96	54.17	20.83	1.04	0.00
9	I am interested if the learning media has assignment documents	8.33	46.88	40.63	4.17	0.00
10	I need a discussion forum to be able to ask questions with teachers or friends online	34.38	54.17	11.46	0.00	0.00
11	I am interested if learning vocational basics using e-learning media	33.33	51.04	15.63	0.00	0.00
12	I think learning vocational basics using e-learning media can increase my motivation to learn	26.04	45.83	28.13	0.00	0.00
13	Vocational basics subjects are difficult to understand if explained in theory only	33.33	43.75	7.29	14.58	1.04
14	The subject of vocational basics is a subject that is difficult to understand	5.21	43.75	32.29	7.29	11.46
15	When explaining vocational basics subjects the teacher uses media	29.17	60.42	8.33	1.04	1.04
16	Teachers never present interesting learning media in the learning process	1.04	25.00	40.63	15.63	17.71
17	The teacher explains the material using the LCD provided by the school.	36.46	52.08	11.46	0.00	0.00
18	I have gadgets (laptop, cell phone)	46.88	52.08	0.00	0.00	1.04
19	I always bring gadgets (laptop, cell phone) to school	45.83	53.13	1.04	0.00	0.00
20	I think that learning vocational basics by using e-learning media will be more interesting in learning	80.21	19.79	0.00	0.00	0.00

The table above shows that students really want to use learning media that is e-learning, because of the facilities and infrastructure factors that support it.

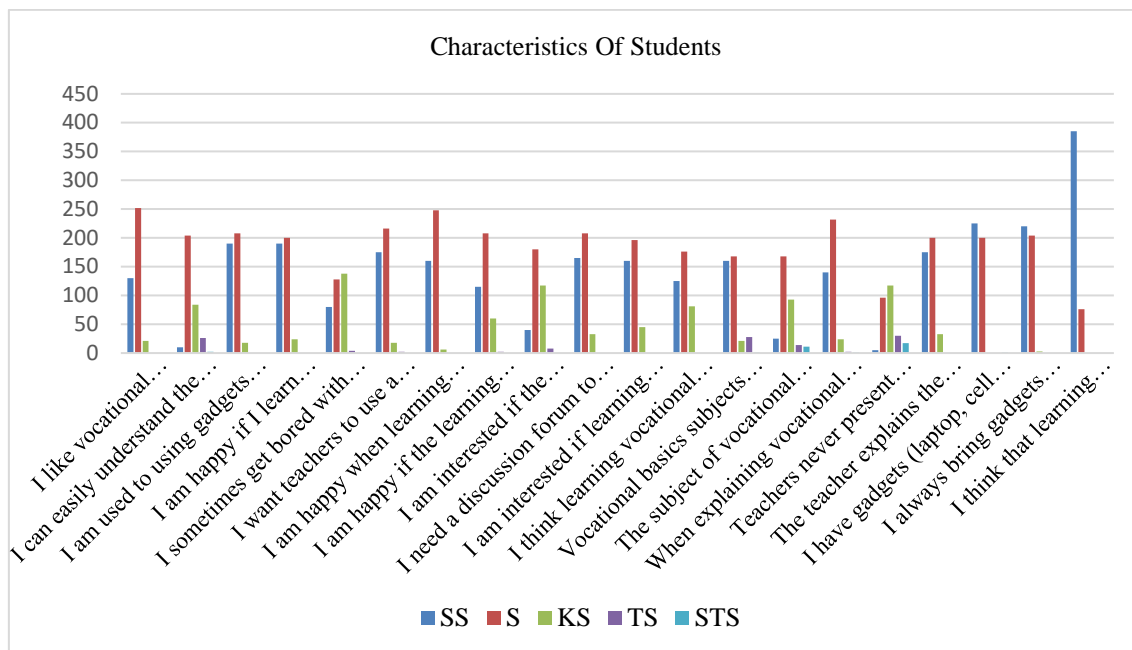When depicted on the bar chart as below:

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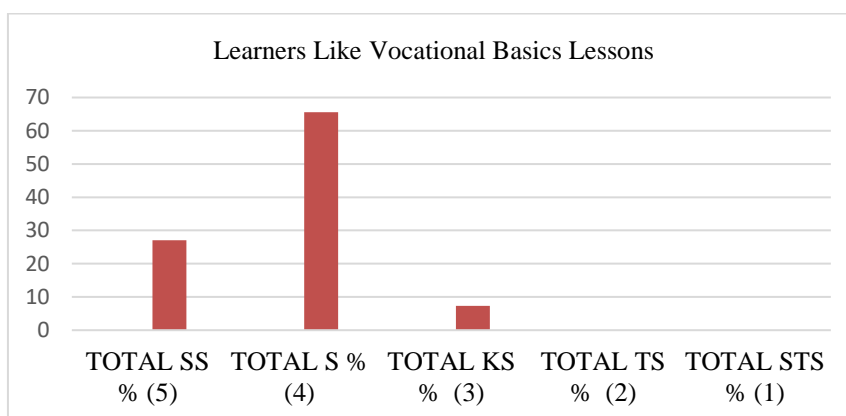**Figure 1.** Student Characteristics

Figure 2. Learners' response to liking the Vocational Basics lesson

Based on the diagram above, it proves that students like the highest vocational basics learning which is obtained at 65.53%, namely agree, so this is an asset to create a pleasant learning atmosphere.
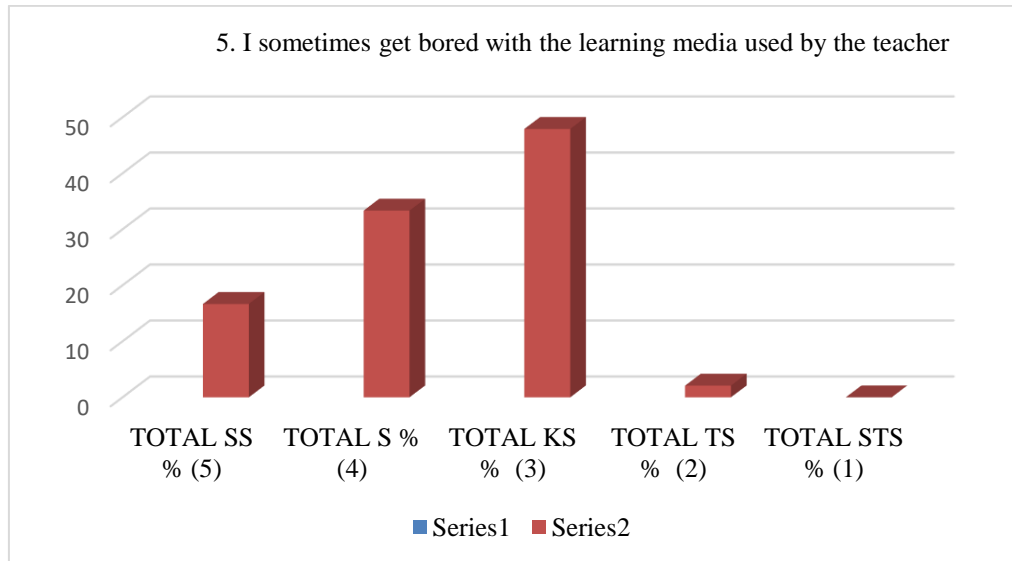
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Figure 3. Learners' Responses Regarding the Learning Media Used

Based on the diagram above, the students' response to the learning media used by the teacher obtained the results of SS (very like) 16.67%, S (like) 33.33% and KS (less like) 47.92%, and disagree by 2,.08 students. Based on these results, it shows that students need other learning media so that students do not feel bored.
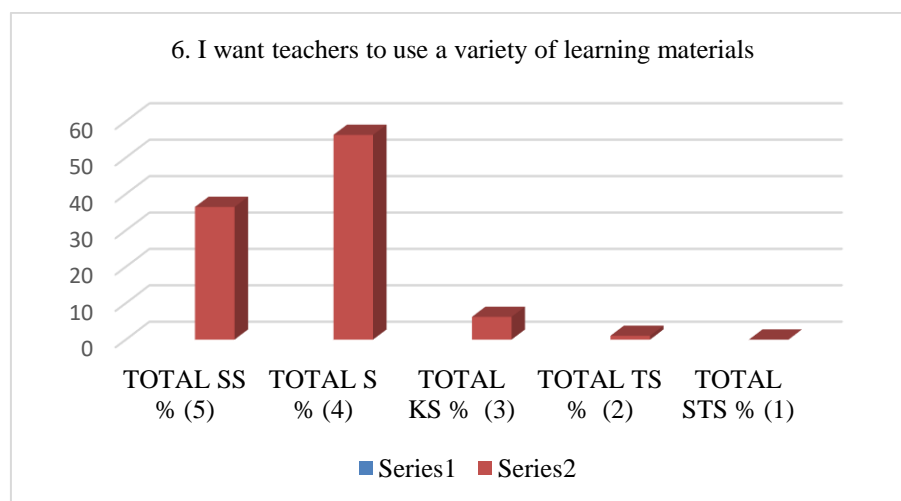

Figure 4. Learner Response to Teacher using varied learning materials

Based on the diagram above, the responses of students regarding varied learning materials obtained the results of very like 36.46%, like 56.25%, dislike 6.25%, and dislike 1.04%. shows that students want varied learning materials which have content in the form of images, sounds, color combinations, can be accessed anywhere and anytime, have discussion forums and others.
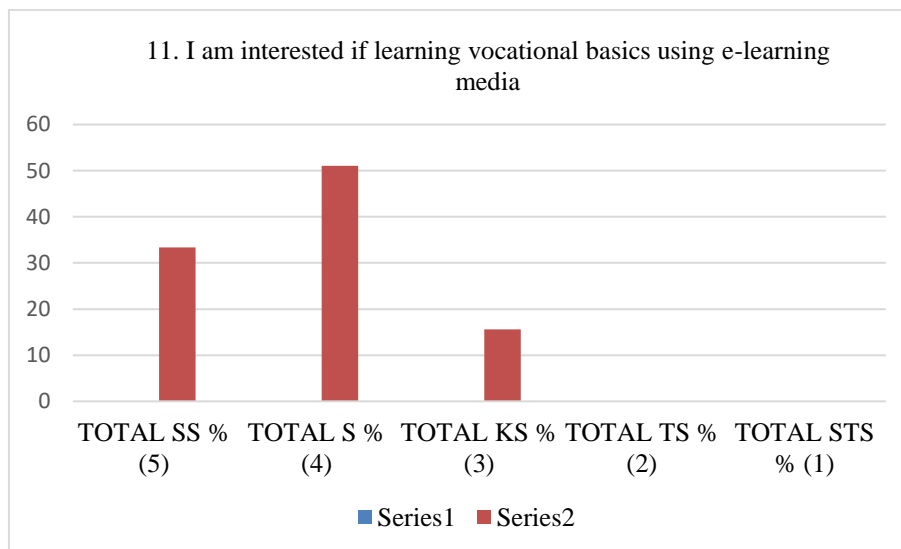
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Figure 5. Response Students' interest in using e-learning media

From the results of the students' responses above regarding the students' interest in the use of e-learning learning media, the results are very like 33.33% like 51.04%, and less like 15.63%.
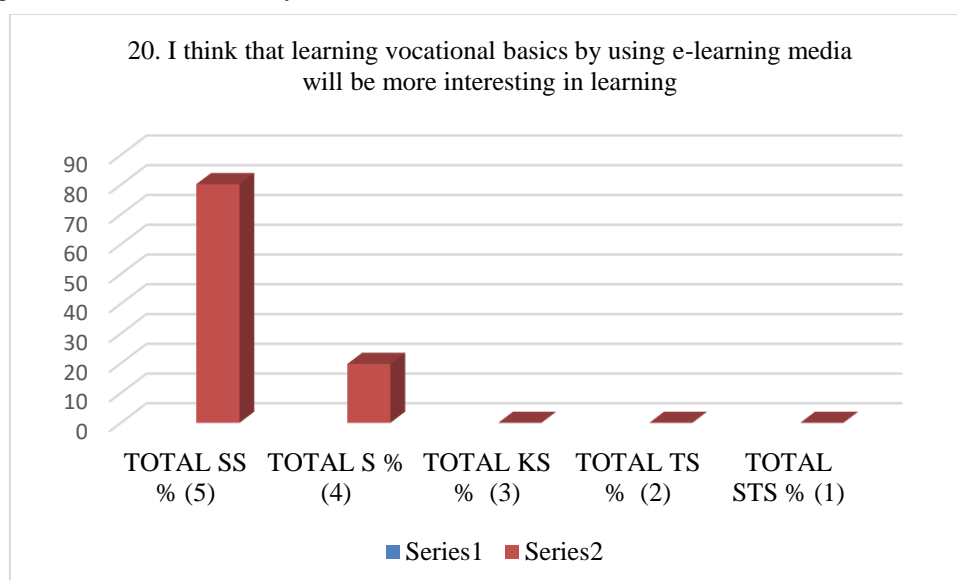

Figure 6. Students' response to the media used

Based on the response of students to the use of e-learning media will be more interesting in learning, the results obtained strongly agree 80.21%, agree 19.79%, less like 0 and dislike 0, it can be seen that students are more interesting using e-learning media. So from the diagram it can be stated that students at SMKN 3, SMKN 1 and SMKN 6 Bengkulu City strongly agree with the existence of learning media that is e-learning so that learning becomes interesting.

Teacher Interview Result

This study not only collected questionnaire data from students but also conducted interviews with two Vocational Basics teachers at SMKN 3 and SMKN 6 in Bengkulu City. The results of interviews that have been conducted are obtained regarding the facilities and infrastructure owned by each school already has an internet network and children use their respective internet quota.

The results of the second interview were about the learning process related to teaching materials, learning media, activities and subject matter. At the time of the interview, the average teacher used book teaching materials, or e-books, power points and animated videos. In the learning methods used by teachers, there

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are many kinds of lectures, questions and answers and discussions. In the material on the basics of engineering the teacher uses lecture, question and answer, discussion and practice methods.

It turns out that there are still students who find it difficult to understand the material presented. This strengthens the teacher's need for teaching materials that can attract the attention of students, especially in vocational basics subjects. Because with the motivation of students learning is very important so that independence occurs and can improve learning achievement.

The third interview result is that the school policy allows students to bring communication devices such as cellphones into the school environment and computers. Based on the results of interviews that have been conducted, the teacher gives a positive response to developing LMS-based teaching materials so that it is expected to help teachers in the learning process.

The results of this study are in line with previous research [16], namely students and teachers really need LMS-based e-learning teaching materials (Learning Managemant System). There are differences between this research and previous research, namely in terms of the subjects used. The subject of the previous research was Digital Simulation, while this research developed an LMS on Vocational Fundamentals subjects.

D. Conclusion

Based on the results obtained both using observations, interviews and questionnaire analysis of students' needs for the development of LMS-based teaching materials in vocational basics subjects, the results show that the development of teaching materials is needed by students and teachers to support the learning process. And it is hoped that students can learn independently because they can learn anywhere and anytime and can improve student achievement.

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